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SAGITTARIA EDWARDSIANA, A NEW SPECIES FROM THE NEW JERSEY PINE BARRENS

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(Plate 454)¹

ON June 30, 1935, Mr. J. L. Edwards, W. L. Highton, and the writer visited the New Jersey pine barrens in the vicinity of Speedwell, in quest of the rare *Pogonia divaricata*. After exploring this region, we botanized in the bogs along a small creek just above its junction with the Wading River, about two miles north of Washington, Burlington County. Here we found a great abundance of *Narthecium americanum*, also the southern *Rhynchospora oligantha*, which we had found earlier in the day in a bog just south of Chatsworth. While the writer was collecting in the nearby bog, Mr. Edwards discovered and called his attention to a peculiar looking, decidedly succulent *Sagittaria*. Realizing that this was something that was new to us, we collected several of the plants. Unfortunately it was too early in the season for fruiting material, but most of the specimens were in flower, with the inflorescences raised just out of the water. The great, fleshy phyllodia mostly exceeded the scapes and tended to float on the surface. The plants were growing on a muddy bottom, in 1½ to 2 feet of water, in close association with *Scirpus subterminalis* and other submerged aquatic species.

Specimens of the flowering material of this *Sagittaria* obtained in 1935 have been shown to a number of critical students of the north-

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eastern flora, but none have been able to satisfactorily determine it. Further, the writer has been quite unsuccessful in his attempts to match the plants with *S. teres* or the many forms of *S. graminea*, *subulata*, and other species with which it might be identified.

Without fruits, the Washington specimens could not be placed in any one of the known species groups in the genus. Consequently, attempts were made to secure such material during this season, 1936. On Aug. 28, more flowering plants were found in the Oswego branch of the Wading River near Martha, but still no fruits. On Sept. 15, the writer revisited the Washington station and collected a good fruiting specimen with mature achenes. Now, with all the characters known, we find that our plant is most closely related to *S. graminea* and *S. teres*, but different from both in several details.

The fruiting pedicels are erect, not recurved, thus eliminating the slight possibility of affinity with *subulata*. The phyllodia are decidedly elongate, terete and succulent, exceeding the scape, very different from the condition in either *teres* or *graminea*. True leaves with blades are apparently never developed. The peduncle is quite thick and fleshy, contrasting sharply with the rather slender scapes of *graminea* and *teres*, and bears regularly three or four whorls of flowers, three flowers in a verticel, with the lowest group pistillate. The achenes are most distinctive, differing from those of *graminea* in their turgidity, in their very dark brown, almost black, color, in having the straw-colored wings standing up to form definite ridges, and in having the minute beaks either erect or oblique, rarely incurved. From the achenes of *teres* these differ in having the wings both straw-colored and quite entire, not at all crenate or broken, as is regularly the case in that species. The staminate flowers bear twelve stamens, with the filaments slightly shorter and more pubescent than in *teres*.

In naming this species, I dedicate it to Mr. J. L. Edwards of Montclair, N. J., a most able and critical field botanist.

SAGITTARIA EDWARDSIANA, sp. nov.—Planta aquatica, monoecia, submersa radicibus fibrosis; phyllodia longa, linearia, teretia, succulentia, acuminata, plerumque superantia scapum 12–51 cm. longa 4 mm. crassa, aliquid nodosa; scapus aliquatenus crassus carnosusque, 22–53 cm. longus, 1–2.5 mm. crassus, fere tres vel quatuor verticillos ferens, infimos fertiles, pedicellis gracilibus bracteis ovatis fuscis subtentis, 3 mm. longis. Flores steriles in pedicellis 0.8–2 cm. longi; sepala tria, viridia, obtusa, 4 mm. longa; petala tria, alba, 5–6 mm. longa; stamina 12, filamentis valde dilatatis, 1 mm. longis, basi 0.8 mm. latis, dense

pubescentibus, antheris luteis, 1 mm. longis 0.8 mm. in diam. Pedicelli fertiles fructiferi erecti, 1.5 cm. longi; achenia fusca, 1.5–2 mm. longa, rostris minutis gracilibus vel erectis vel obliquis, marginibus lateribusque aliquot cristas stramineas, non crenatas, vel alas ferentibus.

SAGITTARIA EDWARDSIANA, n. sp. Monoecious, submerged aquatic herb with fibrous roots; phyllodia long, linear, terete, succulent, acuminate, usually exceeding the scape, 12–51 cm. long by 4 mm. thick, somewhat nodose; the scape relatively thick and fleshy, 22–53 cm. long and 1–2.5 mm. thick, typically bearing three to four whorls of flowers, the lowest pistillate, the slender pedicels subtended by dark ovate bracts, 3 mm. long. Staminate flowers on pedicels .8–2 cm. long; sepals three, green, blunt, 4 mm. long; petals three, white, 5–6 mm. long; stamens 12, with the filaments much dilated, 1 mm. long by .8 mm. wide at base, densely pubescent; the anthers yellowish, 1 mm. long and .8 mm. in diam. Pistillate pedicels erect in fruit, 1.5 cm. long, the achenes dark brown, 1.5–2 mm. long, with minute slender beaks either erect or oblique, the margins and sides with several stramineous entire crests or wings.—**TYPE** in Bailey Hortorium; **COTYPES** in Gray Herb., Cornell University Herb., and Clausen Herb. On muddy bottom in 1.5–2 ft. of water in branch of Wading River two miles north of Washington, Burlington Co., NEW JERSEY, June 30, 1935, *J. L. Edwards, W. L. Highton, and R. T. Clausen* 1741.

Besides the type collection there may be cited as topotypes: *W. C. Wilson and R. T. Clausen* 2358, in branch of Wading River north of Washington, Sept. 15, 1936; also *J. L. Edwards, J. Kezer, and R. T. C.* 2317, muddy bottom of Oswego River, Martha, Burlington Co., New Jersey, Aug. 28, 1936.

BAILEY HORTORIUM,
Ithaca, New York.

EXTENSION OF RANGE OF CALAMAGROSTIS EPIGEJOS.—At the time Prof. A. S. Hitchcock published his "Manual of the Grasses of the United States" February, 1935, this grass was known only from Harwich and Gloucester, Massachusetts, and from Montgomery County, Pennsylvania, northwest of Philadelphia.¹

Early in September, 1936, a thriving colony of this grass was found in Juniper Swamp near Middle Village and south of Elmhurst, L. I.,

¹ Mr. Beals' material is like that at the stations in Massachusetts and Pennsylvania, which was discussed in detail in *RHODORA*, xxxv. 64, 65 (1933), whence Hitchcock derived his information. It belongs to var. *GEORGICA* (C. Koch) Ledeb., a local variety of southern Russia, rather than to the coarse, typical *Calamagrostis epigejos*, Hitchcock in his *Manual* not admitting most varieties.—M. L. F.